249 pulp is chopped. Three days later the chopped material is removed and the surface of the cavity is scratched with a rakelike implement. On the fourth day, collection of the juice begins twice daily. Each time juice is collected, the surface of the cavity is scratched with the rakelike implement. The juice is dipped out with a small pottery vessel and poured into a larger container. If the juice is to be shipped to Uruapan it is put in a 25-liter can. A good plant produces slightly more than 2 liters a day.

252 The bud of the wild agave is cooked in a round hole, 1 meter in diameter and 1 meter deep. The hole is filled with small stones to within 10 or 15 cm. of the top, and a large fire is built on top of the stones. When the fire dies down, the agave buds are thrown on it, covered with leaves of agaves and trees, and then sealed with earth. On the third day the oven is opened. The thick fleshy end of leaves of the smaller wild agave are also roasted. The season is from November to May.

Approximately 20 men in Cherán roast agave in season. They must eat sugar when the agave is cooking so that it will emerge sweet. [834] They must also abstain from sexual intercourse during the 3 days the agave is in the oven.[10]

245 *Pears.*—The most important fruit in Cherán is the pear. It is carried by traders as far as [439] Guerrero. Three types are recognized: *leche* (uérgamóte), *pardo* (ɬarápiti), and t'ačani (Spanish name unknown). The only significant difference recognized is that the three types mature at different times, although some say only the uérgamóte transports well.

245 Pear trees are always grafted on a rootstock of wild crab apple, *tejocote*. (This is a sloe-242 like fruit which bears a marked resemblance in flavor and appearance to the true crab apple.) The *tejocote* trunk is cut with a saw and then split. A pear graft is inserted at each end of the split, sealed in with wax, and wrapped in clean cloth. It is believed the grafts will grow only in January, February, and March, but a school teacher with experimental tendencies claims to have grown them at all seasons.

[1944] [10] Agave is of varying importance in other towns. In Angáhuan the techniques are similar. The plant is known here as quiote; the leaves are called ítikua, the stalk or bud, támaŋ. Mentioned Chilchota makes mescal. The leaves are cooked in earth ovens, macerated with clubs in cement tanks, fermented several days, then distilled. The Tarascan terminology relating to the agave and its processing survives in part.

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243 is often retarded until the following December or January.

246 Fodder, consisting of that part of the maize
251 plant above the ears, is cut in September, when the plant is still green and the ears well formed. In the Sierra, fodder is often stored on platforms constructed in trees. Normally it is taken to the village and placed in sheds or on log platforms in the house lot (pl. 5).

243 Since the late fall maize harvest of Cherán, described by Beals (1946, pp. 24–25), is typical of most of modern Tarasca, no attempt will be made to repeat the data here. In only one area—the
[493] Zacapu Basin—are four-wheeled wagons (*guallines* made of the frame and wheels of abandoned autos) used to haul maize from the fields to the
[492] village. In all other areas burros haul the ears in sacks (*costales*) or nets. Ears of maize are
251 stored in the lofts of the main house; shelled corn is never stored. The ekuaru corn that is kept for seed and food is hung by the husks in bunches (*piña*, sandángata) or in rows over poles inside the house or on the veranda.

242 *Crop rotation and fallowing.*—Except in ex-
243 ceptionally fertile lands, field maize is rarely grown for two consecutive years on the same ground. In the basin plains of the Sierra, corn is often planted without fallow in spots refreshed by annual deposits of alluvium, as at the base of alluvial fans and in sink areas in the center of basins. The soils of the recently drained lacustrine plain of Zacapu are so rich that they support annual maize crops without rotation or application of fertilizer. Generally in the Sierra, maize fields in the basin plains and lower slopes are fallowed for 10 or 12 months every other year. In such fields only maize is planted. Usually during a given year, half of the plains land belonging to a village and a portion of the slopes are fallowed, the rest being planted; when the village possesses more than one basin plain, cultivation and fallow are alternated from one to the other. Ordinarily in the *desmontes* and *jollas* wheat or barley are rotated with maize (one year wheat, one year maize, one year fallow). In the temporal lands surrounding the Sierra customarily two crops per year, one of maize, the other of wheat or barley, are obtained from a given piece of ground. The land is then fallowed 8 to 12 months. (Wheat planted in November, harvested following April or May; maize planted in June, harvested in

242 November; land fallowed until following Novem-
243 ber.) Often fallow and planted fields are alternated between the slopes and the plains in the temporal lands.

Fertilization in field agriculture.—Tarascans make little or no attempt to apply fertilizer to maize fields. Occasionally animal manure (*estiércol*) from the stables in the house lots is spread over small parts of fields nearest the village.[86] Sheep and cattle, however, are turned into the fields after harvest, and shepherds are often paid to bed flocks in the fields. No commercial fertilizer is used, owing to its high cost. As mentioned above, new *desmontes* are fertilized by wood ash from freshly burned brush.

Uses of Maize—*Food.*—As in all indigenous
262 areas of Mexico, maize is the principal foodstuff
252 of the Tarascans. Six types of maize foods are common among modern Tarascans: (1) green corn, or roasting ears (*elote*, tirîapu); (2) toasted kernels ground to powder and mixed with sweetening (*pinole*, japúmata); (3) maize dough wrapped in maize leaves and boiled (*tamal*, k'uɪúnda); (4) maize gruel, or dough dissolved in water (*atole*, kamáta); (5) boiled maize kernels with shell removed (*pozole*, máskuta), similar to North American hominy; (6) thin cooked griddle cakes of maize dough (*tortilla*, ičúskuta), at present the most important single food item.

Elote foods.—Green corn is prepared by parching and by boiling. Without removing the inner husk, ears are often parched in the direct flames or under burning coals. Corn so prepared is called uirîkan in the Sierra. Ears roasted with husks removed are termed "uirîkata." Boiling with husks removed (jáman) is also common. Green ears are preserved by boiling and drying in the sun for many weeks. In the dried form they are called uačákata, and the consistency of fresh corn is revived by soaking and reboiling. Other types of maize foods are made from *elote:* a tamal (učépu) from early green maize; various atoles (atole de grano, atole de t'okéri, de uačákata, etc.); maize which is between the green and mature states (t'okéri) is often ground, shaped into small cakes, and boiled. The maize most frequently used for

[86] In only one instance did the writer observe systematic application of manure. This was near the new Tarascan town of Cahuantzin, 5 km. east of Uruapan. In planting maize, the planter was followed by an individual who dropped a handful of manure over the seed. A plow followed, covering the seed and manure.

245 *Castilla*), and the *granada de China*, and a great variety of native subtropical fruits such as the aguacate, chirimoya, guayaba, and zapote blanco. In the warmer sections of the *tierra templada* are found tropical fruits, the native mamey and zapote prieto, the Asiatic mango, Old World varieties of the banana, and the possibly native plantain.

245 177 797 The European fruits were brought into the Tarascan area early in the 16th century mainly by missionaries. Every mission, church, or convent had its small garden where the priest and Indian neophytes cared for fruit trees and vegetables. Consequently the new fruits spread rapidly among the Tarascan villages, and were soon fully accepted into the native economy. Both the Relaciones geográficas (Mus. Nac., leg. 102) and the Ponce Relación indicate the widespread cultivation of European fruits in the Tarascan area during the latter part of the 16th century. With fruit [242] cultivation the missionaries probably introduced the technique of grafting, e. g., the insertion of apple and pear cuttings into native *tejocote* to insure a hardy root system adapted to local soils and climate. Grafting is still practiced in most Tarascan villages.

245 Arboriculture among modern Tarascans consists of little more than a few fruit trees planted in the ekuáru or along hedgerows. Most trees are only semicultivated. Except for initial grafting [242] of apples and pears and the planting of shoots of other fruits, little care is taken of trees. Systematic pruning is not practiced, nor is any attempt made to control disease or insect pests.

245 438 Although in most pueblos fruit is grown chiefly for local consumption, the people of some towns specialize in raising certain fruits for export. The Sierra communities of Cumachuén and Pichátaro are the apple producers;[96] Cherán, Parangaricutiro (prior to the volcano), Tancítaro, and the *rancho* of Tenguecho specialize in pears.[97] In these towns the entire ekuáru of some households may be devoted to fruit trees, forming a small

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[439] [96] Many varieties of apples are marketed in these towns. The most popular is termed *curuxan*, a reddish fruit picked in August and September. Others, *chats*, *mariceva*, *chats de tierra* (a small crab apple), are harvested in October. In addition, the small red *manzanas* is grown in Pichátaro. Apples from Cumachuén and Pichátaro are carried by *arrieros* into the *tierra caliente* as far as Petatlán on the Pacific coast of Guerrero. They are also taken to the large markets of the plateau: Zamora, Pátzcuaro, Zacapu.

[97] In 1760 pears formed one of the main industries of Capacuaro, but are now relatively unimportant (AGN Historia, vol. 73, f. 230). See Beals, 1946, pp. 37-38, for description of pear picking.

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239 In spite of unfavorable environment for stock raising, many families possess small herds (10–25 head) of cattle, which roam the Sierra forests.[107] During the latter part of the dry season some cattle die of starvation, and the springs and wells barely afford sufficient water for existing herds. The fatter animals are occasionally sold to the local butcher or home-killed for meat. Only the more wealthy have riding horses, and few except *arrieros* possess mules. When in use oxen and burros are often stabled in the house lot. All livestock is turned into the fields after harvest to graze on stubble and to fertilize the land. The small animals, such as sheep and pigs (*ganado menor*) are common throughout present Tarasca.[108] In almost every village a few families own sheep, flocks ranging in size from 50 to 1,000 head. The greatest number of flocks are found around the higher mountains of the Sierra, such as Tancítaro,[109] Patamban, and Quinceo, where summer pastures (bunchgrass) are abundant near the summits. In [242] winter, flocks are grazed in harvested cornfields, for this is a recognized method of soil fertilization. Most of the inhabitants of the *ranchos* around Cerro de Patamban are shepherd-farmers, at least half of their time being devoted to sheep raising. During the summer months boys and girls are

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[107] Few data exist concerning the introduction of cattle into the Sierra. The original land title of Pamatácuaro, dated June 1632, mentions the possession of European domestic animals by the Indians of that village. "Tienen *los naturales como pobladores las preheminencias necesarias de pueblo, Ingleria, campanas sonoras, ornamentorio: chrias de todas clases de ganados, Bacas de vientre, Puercos, asnos, asnas y bestias mulares y caballares . . .*" Again, from the same document: ". . . *los animales y ganados son ovejas y de compañia ynsudo . . .*" These data were taken from a certified copy (1937) of the original document; the latter is reported to be in the *jefatura* of Pamatácuaro. If the document is correct, European animals were taken into the native culture at an extremely early date. The Ponce Relación (1572, vol. 3, p. 133) mentions herds belonging to natives pasturing on the slopes of Cerro de Tancítaro and watering at the lake on its summit in 1584. Around 1700 the people of Charantátacurin possessed a *sitio de ganado mayor* (pasture for large animals such as horses and cattle) near the village (AGN Tierras, vol. 887, exped. 6). In the northern plateau and *tierra caliente* regions, where colonial cattle *estancias* were numerous, many Indians quickly became *vaqueros*, but probably few acquired their own herds.

[108] Tarascans quickly adopted the sheep. By 1580 many Indians around the shores of Lake Cuitzeo possessed flocks numbering from 300 to 400 head. ". . . *crian sus carneros con tan buen orden y consierto como en España . . .*" (Mus. Nac., leg. 103, Rel. de Cuitzeo). A great number of Indians living near the northern plateau pastures were forced to tend flocks of Spanish *encomenderos*. The Lake and Sierra Tarascans also likely acquired sheep at an early date. In many parts of Mexico the Indians rapidly took to sheep raising soon after the Spaniards introduced the animal early in the 16th century. During the colonial period Indians were the chief sheep raisers in New Spain, either as hired shepherds or as owners of flocks. Possibly the annual or semi-annual wool clip and the fact that the smaller animals are more easily herded than cattle, prompted the natives to adapt themselves readily to sheep raising.

[109] Most of the flocks on Tancítaro and other areas adjacent to Paricutin were destroyed by heavy ash fall during the spring and summer of 1943. Formerly, some Tarascans in that area owned flocks as large as 5,000 or 6,000 head. One man in Nurio is reported to have had 20,000.